United States
Department of
Agriculture

Forest Service

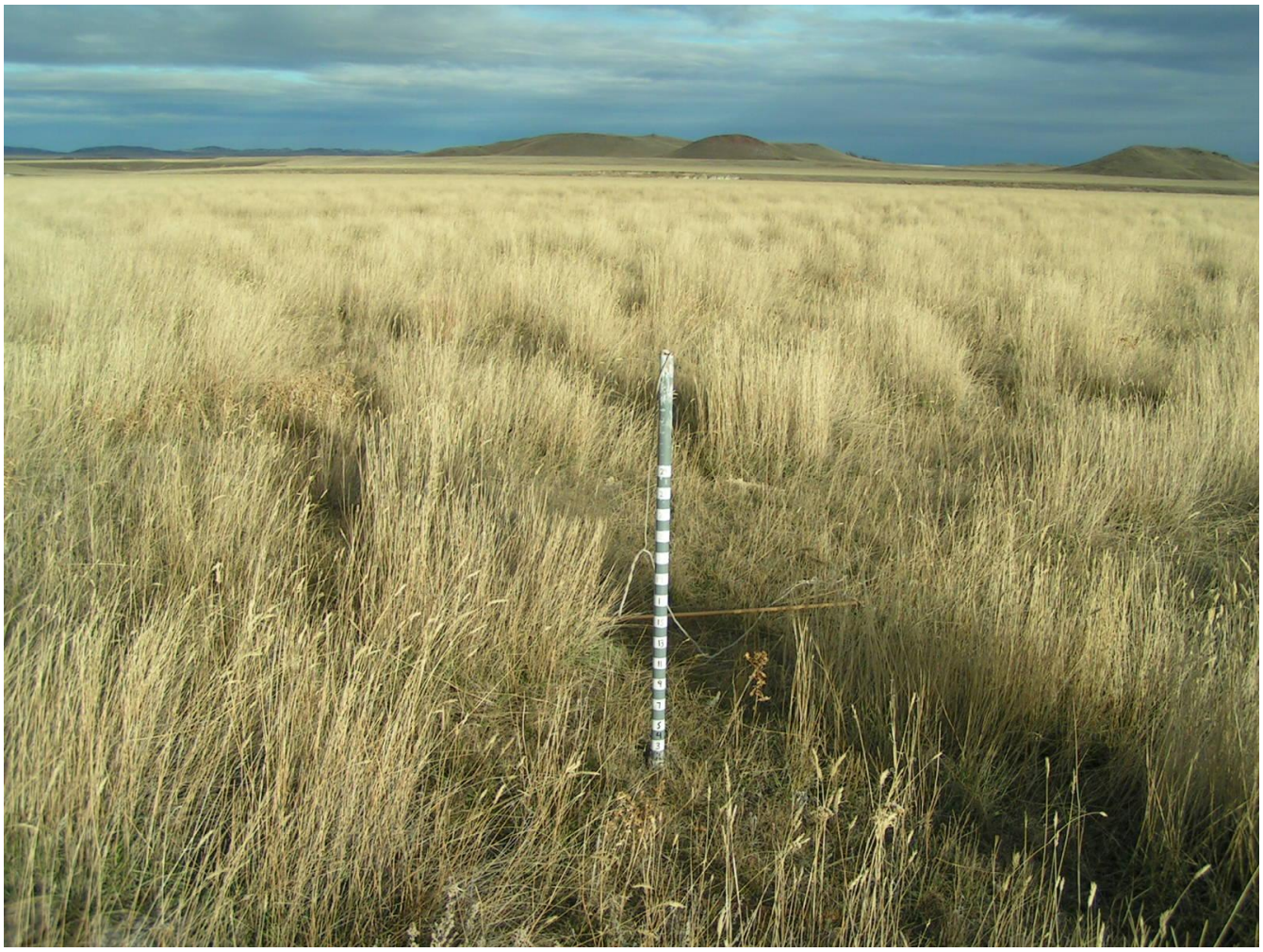
**Rangeland
Management
Staff**

Washington, DC

February, 2009

Robel Pole

Field Guide



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Overview

General Description

The Robel Pole sample method provides a simple and statistically reliable method for monitoring vegetation structure and herbage left ungrazed (standing biomass/crop). This method is useful for managing livestock grazing, wildlife habitat and plant diversity. The Robel pole method consists of taking visual height obstruction readings (Observations) using a pole having alternating white and gray bands. Plant identification skills are not necessary. The following vegetation attributes are monitored with this method:

Vegetation structure
Standing biomass

The Robel Pole method can be used in combination with the Site General and Ocular Macroplot methods (which are defined in separate field guides) to obtain additional species-level information (e.g. vegetation classifications, species dominants). The ***USDA Forest Service Robel Pole Protocol*** is a simple, proven way to record vegetation structure and standing biomass for a study area.

All of the corporate data standards and attributes published in this protocol are supported in the USDA Forest Service Natural Resource Information System (NRIS). A required set of core attributes must be collected during field work and electronically stored in the corporate NRIS application to meet the minimum business needs of the Site General Protocol in order to add the Robel Pole sample. Table 1 lists the required attributes for Robel Pole. Detailed attribute descriptions and collection standards follow later in this document.

Number of Transects
Robel Pole Band Width
First Transect Location
Station Interval
Transect Number
Number of Observations
Station Number

Table 1: Fields required by the USDA Forest Service Robel Pole Protocol.

For permanent monitoring, the following attriutes are strongly suggested: Transect Length and Bearing, First Station Location, Bearing and Distance to next Transect. Data can be recorded in the field using the standard field form for Robel Pole (Appendix C) and then entered into NRIS. The NRIS application uses an ArcMap "Task Assistant" and Windows data entry forms to guide the user through a common workflow to enter and edit the spatial representation of the site and the associated attribute data.

This Robel Pole Field Guide makes occasional references to the NRIS Rangeland Inventory and Monitoring computer application. However, the field guide is not meant to be a user guide for the

NRIS application; it is solely a guide to data collection in the field. User Guides, Administrative Guides, Stewardship Guides and other relevant information can be accessed via the NRIS FSWeb website **http://fsweb.nris.fs.fed.us/**.

Area of Use

The Robel Pole protocol is fast and requires a minimum of training. It is most effective in upland and riparian areas where grasses, forbs, and shrubs that are less than 4 feet tall are dominant. The method is less effective in shrub dominated sites. In some sagebrush types, sampling might occur between shrub patches. When sagebrush is very dense or tall the method cannot be used. Critical to its success are locating the monitoring site within a single plant community in a representative area and taking sufficient samples.

Mapping the Site

A spatial location and Site General form are required for each site prior to adding the Robel Pole sample. Requirements for locating a site can be found in the Site General Field Guide (**http://fsweb.nris.fs.fed.us/products/Rangeland_Inventory_Monitoring/getstarted.shtml**). In addition, if a reference point is used from which the first Robel transect is located; the Locations tab on the Site General can be used to assist the sampler in locating the starting point. A hand drawn map is also helpful in relocating sites and transects.

Robel Pole Field Form Instructions

Descriptions of data fields are presented for applications requiring vegetation inventory and monitoring using the Robel Pole method. Required data fields are indicated in the description and on the attached field form. Category headings and field numbers correspond to the layout and naming conventions used on the attached Robel Pole Field Form. Fields that have a standard "List of Values" (LOV) associated with them are listed in Appendix B. During data collection in the field, one of these values must be selected. No other values are appropriate to use. The Robel Pole Field form is in Appendix C of this field guide.

General Information

1) Site ID: *Required*
Record the 30-digit code that uniquely identifies the site. This is the same number used on the Site General Form. During data entry in the Rangeland Inventory and Monitoring application this field will be automatically linked from the Site General Form when creating the Robel Pole sample.

2) Date: *Required*
Record the calendar month, day, and year the site was visited This is the day the information was collected in the field, ***not*** the date the data was entered into the computer.

3) Image, 4) Name, 5) Description, 6) Prior Image Location:
Record the photo or image ID number, name and a description of the image on the Site General Form. After the image is filed, record the computer path name to locate the image file. Photos are valuable records which capture important characteristics for a site. Photos should be taken prior to disturbing or reading transects. Recommended photos include one or two site photos, one photo along each transect, one photo of the Robel pole on each transect. Other photos that may help to locate transects or that might identify unique features are also a good idea.

Sample Design

7) Number of Transects: *Required*
Record the total number of transects sampled. The national standard is 3 per section (640 acres). Transects are the independent sample units.
8) Robel Pole Band Width: *Required* and 9) UOM: *(LOV)*
Record the width of the bands on the Robel pole. The national standard values are 0.5 or 1 inch.
10) First Transect Location: *Required* and 11) UOM: *(LOV)*
Record the first transect location in feet or meters.
12) Station Interval: *Required* and 13) UOM: *(LOV)*
Record the distance between stations along the transect. The national standard is 30 feet. Record the distance UOM in feet or meter. If stations are far enough apart, they may be analyzed as independent sample units.

Transects

The Transect design fields are ALL mandatory when sampling permanent monitoring sites.
14) No. (Transect Number): *Required*
Record the transect numbers.
15) Observations: *Required*
Record the number of observations that are being read at each station or stop along a transect. The national standard is 4 and generally oriented North, East, South and West. This value will generate a number of columns in the Station grid. The standard pole is 1 inch in diameter. The height from which observations are made is 39 inches (1 m). The distance between the observer and the pole (cord length) is 157 inches (4 m).
16) Length: and 17) UOM: *(LOV)*
Record the length of each transect. The standard is 600 feet but this may vary and is a function of sample area size. Record the UOM in feet or meters.
18) Bearing:
Record the bearing direction (0-360 degrees) of the transect.
19) First Station Location: and 20) UOM: *(LOV)*
Record the first station location in feet or meters. The national standard is the 30 foot mark on the tape where "0" is the transect starting point)..
21) Bearing and 22) Distance to Next Transect: and 23) UOM: *(LOV)*
Record the bearing (0-360 degrees) and distance (with UOM in feet or meters) from the end of the current transect to the start of the next transect. For Transect 1, this will be the bearing and distance from the reference site location to the start of Transect 1. If no bearing and distance are provided for Transect 1, then it is assumed the first transect starts at the reference site location.

Stations

24) Station Number:
Record the station numbers. These are usually sequential values starting with "1".
25) Observations:
At each station, record the number from the pole that corresponds to the lowest visible band (highest totally obstructed). Values typically range from 0.0 to 100.0 inches. Both live and dead vegetation are included in this observation.

Appendix A - Literature Cited

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Appendix B – Robel Pole List of Values

9) Robel Pole Band Width UOM: *(LOV)*

Code
Centimeters
Inches

11) First Transect Location UOM: *(LOV)*

Code
Feet
Meters

13) Station Interval UOM: *(LOV)*

Code
Feet
Meters

17) Length UOM: *(LOV)*

Code
Feet
Meters

20) First Station Location UOM: *(LOV)*

Code
Centimeters
Feet
Inches
Meters

23) Distance to Next Transect UOM: *(LOV)*

Code
Centimeters
Feet
Inches
Meters

Appendix C - USDA Forest Service Robel Pole Field Form

(® = Required Fields)

General Information

Site ID®	Examiner®	Date®

Aerial Photo/Images

Aerial Photo Label __ __ __ __ __ __ __ __ __ __	Aerial Photo Set _____
Aerial Photo Number __ __ __ __ __ __ __ __ __	Flight Line Code __ __ __ __ __ __
Aerial Photo Date\Time (mm/dd/yyyy)	
Image ID _____	Description _____
Image ID _____	Description _____
Image ID _____	Description _____
Image ID _____	Description _____
Image ID _____	Description _____
Image ID _____	Description _____
Image ID _____	Description _____
Image ID _____	Description _____

Sample Design

Number of Transects®	Pole Band Width&UOM®	First Transect Location&UOM®	Station Interval&UOM®

Transects

Transect	Observations at each Station	Transect Length&UOM	Transect Bearing	1st Station Location&UOM	Notes:
1					
2					
3					
4					

Distance & UOM	and Bearing	to Start T1 from Reference Site
Distance & UOM	and Bearing	to Start T2 from end T1
Distance & UOM	and Bearing	to Start T3 from end T2
Distance & UOM	and Bearing	to Start T4 from end T3

Stations														
Station	Observations					Observations					Observations			
	1	2	3	4		1	2	3	4		1	2	3	4
1														
2														
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4														
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6														
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Appendix D - Record of Amendments

Version	Date	Author(s)	Reason for Edit(s)
1.0	11-03-2008	Spencer	Initial Draft
2.0	01-15-2009	Spencer	Insert information on national standards.
3.0	02-20-2009	Spencer	Minor edits